Missouri EPIDEMIOLOGIST

Volume 20, Number 1 *January-February 1998*

Tuberculosis Case Report in a Foreign-Born Child

Lynelle Phillips, R.N., M.P.H.
Bureau of Tuberculosis Control

Michael Cooperstock, M.D.
Department of Child Health
University Hospital and Clinics

Tuberculosis is rare in children nationwide. Missouri had seven reported cases in 1997. However, because of its resurgence in many parts of the world, pediatricians should expect to see more tuberculosis in foreign-born children. The following case study illustrates the challenges in diagnosing pediatric tuberculosis, and the rationale behind policies for screening and treating high-risk children.

Case Study

In December 1993, a 6-year-old girl presented to her pediatrician with decreased hearing acuity found by routine elementary-age screening. She had been adopted from a Korean orphanage at 9 months of age and had a history of poor growth there. She had scarlet fever and pneumonia prior to the age of 4, but no other recent significant illnesses since adoption. Adoption records did not indicate vaccination with BCG, and she had no vaccination scar. She had four documented tine tests during the adoption process in 1987 and 1988, all of which were negative. She had a tine test at a community hospital in 1991, results of which are unknown. In December 1993, her ear was irrigated to remove wax, and smears and culture of drainage fluid were negative. After a period of recurrent mild to moderate hearing loss, she was referred to an otolaryngologist, who performed bilateral myringotomy and placement of tympanostomy tubes on January 8, 1996. Mucopurulent fluid was noted in the middle ear. Because of persistent drainage, on February 6, 1996, cortisporin drops were begun. Tobradex drops were begun on February 20, 1996. By late February, drainage had subsided in the right ear after treatment with cortisporin and Tobradex drops and suctioning; drainage persisted in the left ear. Audiology testing showed hearing loss. On March 27, 1996, hearing loss with very viscid mucus or possibly scar bands was noted. Treatment with topical and oral antibiotics continued. Hearing loss and drainage continued, despite intermittent treatment with topical tobramycin, gentamicin and amoxicillin. An allergist diagnosed allergic rhinitis and atopic dermatitis, and an antihistamine was administered. Hearing loss persisted, and otorrhea continued in the right ear. On September 19, 1996, right tympanomastoidectomy and ossiculoplasty with tympanic membrane reconstruction and left ear exploration were performed. Postoperative diagnoses were right chronic otorrhea with mastoiditis, right hearing loss and incus erosion, and left hearing loss with middle-ear granulomas. All cultures were negative for bacteria, acid-fast bacilli and fungus. The pathology report mentioned granulation tissue. A left tympanomastoidectomy was performed and a ventilating tube was placed on December 12, 1996. Biopsy of left ear was reported as cholesteatoma. Further consultation on January 16, 1997, demonstrated no evidence of immune deficiency or autoimmune disease.

On April 16, 1997, earaches and hearing loss were reported. The middle ear tubes were completely crust covered, and were replaced on May 6, 1997. The middle ear fluid grew acid-fast bacilli. An intermediate strength Mantoux skin test gave a reading of 20mm induration. Chest radiograph demonstrated a three centimeter extrapleural paraspinous cold abscess in the left lung apex and calcified lesions of healed primary tuberculosis. Cervical spine x-ray demonstrated tuberculous spondylitis at C7 and T1 with spine compression and marked gibbus formation. Isoniazid, rifampin, pyrazinamide and ethambutol were initiated on May 18, 1997. The initial culture of ear drainage eventually grew *Mycobacterium tuberculosis*, sensitive to isoniazid, rifampin, pyrazinamide, ethambutol and streptomycin. Marked

(continued on page 2)

Inside this Issue...

Page	
4	**Missouri Health Strategic Architecture and Information Cooperative (MOHSAIC)**
6	**Epidemiologist Joins Division of Maternal, Child and Family Health**
6	**Office of Surveillance Established**
7	**1998 Guidelines for Treatment of Sexually Transmitted Diseases**
25	**1997 Index for *Missouri Epidemiologist***

(continued from page 1)

improvement in the appearance of the ears was found. A hearing aid greatly improved her ability to function in school. A pediatric orthopedist recommended surgical stabilization of the spinal deformities. DNA-fingerprinting of the *M. tuberculosis* isolate revealed an 18 band strain, unlike any other found in Missouri.

Discussion

Tuberculosis-endemic countries such as Korea have experienced a recent resurgence in tuberculosis. Children adopted from orphanages in Asia, Africa, Latin America, Eastern Europe, the Caribbean and Pacific Islands may be at particularly high risk. Child care workers in these countries often receive poor pay and lack good health care. These workers have been reported to be at high risk for tuberculosis, and may be the source of infection for children under their care. Because of the lack of an identified exposure in the United States, and the unusual strain type, it is likely the child described in this case study became infected with *M. tuberculosis* while in the orphanage, and developed symptomatic disease in her ears approximately five years after adoption. The Centers for Disease Control and Prevention (CDC) recommends that a Mantoux PPD $\geq$10mm be considered positive for tuberculosis infection in children from endemic countries. However, physicians should evaluate children adopted from orphanages in other countries as cautiously as if they were household contacts to tuberculosis. In these children, a PPD skin test $\geq$5mm should be considered positive. Because of the tendency for false negatives with tine tests, physicians should disregard tine test results and perform PPD Mantoux skin tests on all high risk children. See sidebar at the top of this page. However, Mantoux skin tests may also give false-negative results, especially in severely ill patients, and tuberculosis infection cannot be entirely ruled out on the basis of a negative Mantoux skin test result.

Although this case reportedly did not receive BCG vaccine, many children adopted or immigrating from tuberculosis endemic countries will have received this vaccine in infancy. BCG vaccine is one of the most frequently used vaccines in the world, even though its efficacy for preventing tuberculosis disease remains somewhat questionable. In various studies, efficacy ranges from 0 to 80 percent. BCG does not usually result in a PPD $\geq$10mm, and is **not** a contraindication for a PPD. Immunity appears to wane after about two years. CDC recommends that patients from endemic countries, including children, who have positive PPDs should always be considered for preventive treatment, regardless of prior BCG vaccination. The risk for tuberculosis in PPD-positive children can be virtually eliminated with isoniazid treatment for nine months.

This case also illustrates the elusive ways tuberculosis disease may present in children. This patient had none of the classic signs and symptoms of disease, such as anorexia, fever, night sweats, cough, fatigue or malaise. Smears and cultures were negative for over two years after onset of symptoms. Aside from recurrent ear infection and moderate hearing loss, she was a healthy and happy child, an excellent student, and was involved in several extracurricular activities. Routine assessments for signs and symptoms of tuberculosis in children with positive PPDs may be insufficient to spot the subtle evolution of tuberculosis disease. See sidebar to the left. Isoniazid is safe, well tolerated in children and has been proven effective in preventing tuberculosis. The Missouri Department of Health and CDC encourage

(continued on page 24)

Children at Increased Risk for Tuberculosis

- Children immigrating from, or with travel histories to, endemic countries: Asia, Africa, Latin America, Eastern Europe, Carribean, and Pacific Islands **(No. 1 risk factor for tuberculosis in children)**
- Contact with a contagious tuberculosis case
- Radiographic or clinical findings suggesting tuberculosis
- Children infected with HIV
- Incarcerated adolescents
- Children exposed to high risk settings (nursing homes, homeless shelters, migrant workers, institutionalized adults, drug abuse)

Guidelines for Tuberculosis Control in Foreign-Born Children

- Screen all foreign-born children from endemic countries with Mantoux skin test.
- Disregard previous tine test results.
- Consider a PPD result 10mm or greater to be positive.
- Disregard history of BCG vaccination.
- If possible, treat all PPD-positive children with preventive therapy after ruling out active disease (Isoniazid for 9 months).
- Report all cases of tuberculosis infection and disease to your county health department as soon as possible.

Tuberculosis Skin Testing for HIV-Infected Persons: New Recommendations

Reprinted with permission from the Hawaii Communicable Disease Report, September/October 1997.

The Centers for Disease Control and Prevention (CDC) has recently revised their recommendations regarding anergy skin-testing and preventive therapy for Human Immunodeficiency Virus (HIV)-infected persons.[1] According to these new recommendations, anergy testing is no longer recommended as a routine component of tuberculosis (TB) screening among HIV-infected persons in the United States.

This change from previous recommendations followed a February 1997 meeting at CDC, during which current information regarding anergy skin-testing, Purified Protein Derivative (PPD) skin-testing, and TB preventive therapy for HIV-infected persons was discussed. In formulating these new recommendations, CDC considered the results of this meeting, as well as a review of published studies.

The Test

Anergy skin-testing assesses the cell-mediated, delayed-type hypersensitivity (DTH) responses to skin test antigens. The antigens are administered by intradermal injections using the Mantoux method, and have conventionally been considered positive if an induration measuring 5mm or more occurs within 48–72 hours. Mumps and Candida are usually used as the "control" antigens, since practically all individuals have been exposed to these agents, and should mount an appropriate immune response. PPD is also included in the skin test panel. Impaired DTH response is directly related to a decreasing CD4+T-lymphocyte count, and is also a predictive factor for the progression of acquired immunodeficiency syndrome and mortality in HIV-infected persons.[2,3,4,5] Because of complications associated with active TB in HIV-infected persons, it is important that these persons be screened for latent TB infections, and receive preventive therapy with isoniazid (INH) if indicated.

Limited Usefulness of Test

Several factors limit the usefulness of routine anergy testing in HIV-infected patients. These factors include problems with

- standardization and reproducibility of anergy skin-testing methods,
- the variable risk for TB associated with a diagnosis of anergy, and
- the lack of documented benefit of anergy skin-testing as part of screening programs for *M. tuberculosis* infection among HIV-infected persons.

It is not possible to exactly assess the risk of TB in HIV-positive anergic individuals, but the risk appears to be low. In studies conducted in the United States in which preventive therapy was administered principally to PPD-positive persons,[6,7] no cases of TB were observed in anergic persons. In a multicentered study,[8] the effect of residence on risk for TB was much greater than that of anergy. "In the United States, the public health impact of finding and treating patients who have infectious TB to prevent further transmission, and of providing preventive therapy to PPD-positive, HIV-infected persons to prevent additional infectious TB cases, should be greater than the effect of preventive therapy for HIV-positive anergic persons."[1]

Preventive Therapy

Whether anergic or not, HIV-positive PPD-negative individuals should be considered as candidates for preventive therapy if they have been recent contacts of patients with infectious pulmonary TB. Also preventive therapy may be beneficial for

- children who are born to HIV-infected women,
- children who are close contacts of a person with infectious TB, and
- HIV-infected adults who reside or work in institutions and are continually and unavoidably exposed to patients who have infectious TB.

"In selected situations, anergy testing may assist in guiding individual decisions regarding individual therapy. However, results of currently available anergy-testing methods in United States populations have not been demonstrated to make a useful contribution to most decisions about INH preventive therapy."[1]

REFERENCES:

1. Centers for Disease Control and Prevention. Anergy skin testing and preventive therapy for HIV-infected persons: revised recommendations. MMWR 1997;46(No. RR–15):1–10
2. Birx DL, Brundage J, Larson K, et al. The prognostic utility of delayed-type hypersensitivity skin testing in the evaluation of HIV-infected patients. J. Acquir Immune Defic Syndr 1993;6:1248–57.
3. Gordin FM, Hartigan PM, Klimas NG, et al. Delayed-type hypersensitivity skin tests are an independent predictor of human immunodeficiency virus disease progression. J Infect Dis 1994;169:893–7.
4. Blatt SP, Hendrix CW, Butzin CA, et al. Delayed-type hypersensitivity skin testing predicts progression to AIDS in HIV-infected patients. Ann Intern Med 1993;119:177–84.
5. Dolan MJ, Clerici M, Blatt SP, et al. In vitro T cell function, delayed-type hypersensitivity skin testing, and CD4+T cell subset phenotyping independently predict survival time in patients infected with human

(continued on page 24)

Missouri Health Strategic Architectures and Information Cooperative (MOHSAIC)

Nancy Hoffman, R.N., M.S.N.
Center for Health Information Management and Epidemiology

The Missouri Department of Health (DOH) views an integrated information system as critical to preserving and expanding the Missouri public health system. Based on this belief and recognizing that information was crucial to public health, in 1992, DOH embarked on a project to create an integrated public health information system. This system includes: an integrated client record, a means to collect and assess the health status of Missourians, and a statewide information network which could link public and private health care providers electronically. A group of high level DOH managers and representatives from local public health agencies spent three months creating a strategic plan for information systems. This plan, the Missouri Health Strategic Architectures and Information Cooperative (MOHSAIC) identified all the functions performed by DOH and local health agencies and the data needed to perform these functions. It provides the blueprint for creating the integrated information system.

Much has been accomplished since the creation of MOHSAIC. Accomplishments include:

- Implementation of standards for the purchase of hardware, software and network equipment.
- Development of a wide area network (WAN) that links state and local public health agencies.
- Establishment of initial data standards.
- Connection of DOH employees to one electronic mail system that supports communication with local health agencies and others via the Internet.
- Creation of the DOH Web Home Page that currently provides access to some assessment data via the Internet. The types and amount of data available are being expanded.

The Missouri health care delivery system has undergone changes since the creation of the MOHSAIC plan. Medicaid eligibility and Medicaid managed care are expanding. This is increasing private provider access to more clients previously served by local public health agencies. However, none of these changes in the health care delivery system alleviates the need for a strong public health agency to work with local communities to assess the health status of the population, establish priorities during these turbulent times, develop new innovative interventions and policies, and evaluate the impact of service delivery on service recipients.

The Institute of Medicine report, *The Future of Public Health*,[1] identified three core functions of public health—assessment, assurance and policy development. The public health integrated information system must be structured to address these three functions. The MOHSAIC integrated transaction system enhances the assurance function by:

- Identifying clients that need services.
- Integrating service delivery schedules for families.
- Eliminating redundant data collection.
- Establishing standards for data collection.
- Coordinating care across providers.
- Simplifying provider training to one computer system.
- Automating previous manual functions.

Although the initial MOHSAIC application currently being used by over sixty local health agencies is often referred to as the Immunization System or the Immunization Central Registry, it is far more than that. The scheduling, inventory and immunization components are the initial three of ten components scheduled for development as part of the MOHSAIC transaction system. The remaining seven components are:

Women's Wellness
Surveillance
Laboratory
Regulated Client
Service (Care) Coordination
Environmental
Primary Care

These components are in varying stages of planning, analysis or development. As these components are completed, they will be made available to MOHSAIC users.

The generic client management (registration) portion of the system allows users to register all clients no matter their age or service needs. There is a core of required information such as the client's name, date of birth, race, sex, ethnicity, and Departmental Client Number (DCN). Additional optional demographic information related to the client's occupation, employment, insurance coverage and care provider can also be entered. As additional services are added to the MOHSAIC application, this area may be modified slightly but will continue to be used to register all clients.

MOHSAIC currently interfaces with the Department of Social Services (DSS) DCN files to look up or assign unique numbers for clients. Therefore, any Medicaid, AFDC or Food Stamp DSS client has the same number. The DOH WIC program also uses this numbering system. While the DSS number is used as the primary unique client identifier, system users are encouraged to enter social security numbers (SSNs) when available. This increases the number of matches when attempting to merge other electronic files with the registry. The

registry has the SSN on each newborn so this will be a key matching variable when we match managed care files with the central registry.

At present, users must enter and update Medicaid eligibility and managed care enrollment information. The DSS interface will be expanded in the near future to include the electronic recording and/or updating of Medicaid managed care eligibility and enrollment information.

Previously, two regional immunization systems were created. In the western part of the state, the Kansas City Immunization Information System (KCIIS) served the Kansas City metropolitan area, including Kansas City, Cass, Clay, Jackson and Platte counties. The other regional system was the St. Louis Integrated Immunization Information System (SLIIIS) that served the Eastern Health District, including St. Louis City, St. Louis, St. Charles, Franklin and Jefferson counties. In addition, 99 counties outside the two urban areas were provided the Missouri Immunization Tracking System (MITS) software to use as a stand alone application.

Using funds provided by the Missouri Legislature to create a central registry, DOH accelerated the implementation schedule for MOHSAIC in October 1996. The process of converting existing local public health agency data, merging it with the central registry and initiating the use of MOHSAIC was begun. When the process is completed the KCIIS, SLIIIS and MITS systems will no longer be used.

To create the initial client central registry, a file containing demographic information for all births from January 1, 1994 to the present was created. This file was sent to the Social Security Administration who updated it with the SSNs for these children. DOH staff then worked to identify or assign a unique number for each child. This file was used to create a client central registry record for each of the more than 240,000 Missouri births.

Participating health users are entering both historical and current immunization information for these clients and others seen in their agencies. As agencies implement MOHSAIC, any immunization data entered into a previous electronic system is converted and merged with the central registry data as part of the implementation process.

Access to the system is in real time, with client information being stored in the central database in Jefferson City. Once an immunization record has been updated through MOHSAIC, the information is immediately available to other MOHSAIC agencies. DOH is responsible for the central registry data backup and recovery procedures.

The MOHSAIC integrated information system includes the following functions:

- The central registry is interfaced with the vital records system to enter all new births occurring in Missouri. The Social Security Administration provides SSNs for newborns on a weekly basis which are merged into the central registry. If the birth record includes Hepatitis B vaccine information, this is transferred to the client's immunization history. The file is also interfaced with the adoption and death certificate files to assure proper handling of records for clients included in these files.
- The system supports the documentation in the client's record of immunizations given either by the agency entering the information or by other providers prior to initiating use of the MOHSAIC system. If the child has been seen by another agency or private provider using the MOHSAIC system, the current agency or private provider simply updates the already established record with any additional information.
- Immunization records are maintained from birth through adulthood. Schools will have Internet access to verify immunization status of their children.
- The system allows the documentation of immunizations given at subsequent visits. For agencies using the inventory feature, the system includes the vaccine type, manufacturer, lot number, method of administration, site administered, and name of person administering. In the process, the vaccine inventory is reduced by the amount administered and the monthly "Doses Administered Report" is updated.
- The inventory component of the system can identify each client that received a dose of a specific vaccine by manufacturer and lot number should a recall occur.
- A record for each client can be printed indicating the vaccine types, dose numbers and dates received. These records provide documentation to meet the requirements for day care or school entry.
- The system assesses each client's immunization status and identifies needed immunizations based on the established recommendations. A record can be printed indicating this status and the immunizations due or past due.
- An electronic file of clients that are due or past due for immunizations is created for each provider to assist in reminder/recall activities. This file can be used to create letters to the clients or as an input to an automated telephone dialing system which is available in the system.
- Data from the central registry is available to DOH to determine the immunization coverage rates based on aggregate data for each provider, community or statewide.
- The system has the ability to create files that can be linked with other public or private health information systems using Health Level Seven (HL7) Standards.

In order to realize the full potential for the Immunization Central Registry, it must include immunization information on all Missouri children, no matter who provides the immunizations. Missouri currently has several pieces of legislation

(continued on page 27)

Epidemiologist Joins Division of Maternal, Child and Family Health

Dr. Michael Kramer became the Division of Maternal, Child and Family Health's first epidemiologist on November 3, 1997. He comes to the division from the University of Missouri, where he had been Assistant Professor in the Department of Child Health.

A native of California, he received his MD from the University of California–San Francisco in 1981. After an internship at Mott Children's Hospital, University of Michigan, he completed his pediatric residency at the University of Washington in 1985, where he also received his MPH in epidemiology in 1989. From 1989–91, he served in the Centers for Disease Control and Prevention's (CDC) Epidemiologic Intelligence Service, and was stationed at the University of Iowa. In Iowa, he became interested in asthma among farm children. He stayed on in Iowa to complete a fellowship in pediatric pulmonology. He then spent two and a half years at University of Missouri-Columbia as an assistant professor of child health.

Dr. Kramer says that the difficulty of combining clinical medicine with epidemiologic research prompted him to seek an opportunity to return to epidemiology and public health.

"Clinical medicine is very seductive, and I thought I would be able to combine it with epidemiology," he says. "But epidemiology is my primary interest."

"When I began seeking a position in epidemiology, colleagues both in Washington state and at CDC steered me toward the Missouri Department of Health. I was not aware of just how strong a department it is. CDC is particularly impressed with the department's ability to gather data," Kramer says.

Dr. Kramer's areas of research interest include rural and urban differences in childhood respiratory diseases; environmental exposures and adverse reproductive outcomes; placenta previa; Down Syndrome mortality; and the utilization of health services by children with chronic diseases.

Office of Surveillance Established

The Division of Environmental Health and Communicable Disease Prevention is pleased to announce the formation of a new Office of Surveillance, and the appointment of Howard L. Pue, D.V.M., M.S. as its chief.

The Office of Surveillance was established to track and document the occurrence and distribution of communicable, zoonotic and environmentally induced diseases in Missouri through the development and improvement of the statewide surveillance system. The office:

- Maintains case registries for communicable diseases including tuberculosis, sexually transmitted diseases and HIV and for lead poisoning.
- Assists programs in identifying surveillance data needs, designing data collection processes/systems, developing datasets, analyzing and interpreting data.
- Performs ad hoc analyses upon request from programs or other customers to answer inquiries and help target disease intervention activities.
- Analyzes and disseminates surveillance data at regular intervals to track trends.
- Provides consultation to programs regarding application of surveillance data to program policy/practice development.
- Develops and coordinates ongoing quality assurance processes.

Dr. Pue joined the Department of Health in December upon retiring from the U.S. Air Force, where he was Commander of the 7th Aerospace Medicine Squadron at Dyess Air Force Base in Texas. He received a D.V.M. degree from Oklahoma State University, and a M.S. in Veterinary Preventive Medicine from Ohio State University. He had worked in various capacities in environmental health and preventive medicine in the Air Force since 1983.

The Office of Surveillance staff of 17 includes personnel dedicated to surveillance for HIV, sexually transmitted diseases, communicable diseases, lead poisoning, occupational fatalities and hazardous substance emergency events. Office staff are also developing a Geographic Information System (GIS), and working with the department's Office of Information Systems to develop and implement a new surveillance component of the Missouri Health Strategic Architecture and Information Cooperative (MOHSAIC).

1998 Guidelines for Treatment of Sexually Transmitted Diseases

Physicians and other health-care providers have a critical role in preventing and treating sexually transmitted diseases (STDs). The following recommendations for the treatment of STDs, which were developed by the Centers for Disease Control and Prevention (CDC) in consultation with a group of outside experts, are intended to assist with that effort.

The recommendations, which update those released by CDC in 1993, were reprinted from CDC's *Morbidity and Mortality Weekly Report (MMWR) Recommendations and Reports*, Vol. 47, No. RR-1, January 23, 1998. This issue of the *Missouri Epidemiologist* contains those sections of the guidelines which relate to diseases characterized by urethritis and cervicitis. Other portions of the treatment guidelines will be reprinted in subsequent issues. A full copy of the guidelines in pdf format can be found on the Missouri Department of Health (DOH) Home Page at **http://www.health.state.mo.us/cgi-bin/uncgi/ShowPDF?DocumentName=1998+STD+Treatment Guide&DocumentSource=STDGuide** and also on CDC's Division of STD Prevention Home Page at **http://www.cdc.gov/nchstp/dstd/dstdp.html**.

If you have questions regarding these guidelines, please contact DOH's Bureau of STD/HIV Prevention at (573) 751-6141.

Additional information for medical providers on STDs and STD training courses is available on the Internet at the following sites:

CDC's Division of STD Prevention:
http://www.cdc.gov/nchstp/dstd/dstdp.html

CDC's Division of AIDS, STD, and TB Laboratory Research:
http://www.cdc.gov/ncidod/dastlr/dastlr.html

National Network of STD/HIV Prevention Training Centers:
http://129.137.232.101/STDPTC.html

St. Louis STD/HIV Prevention Training Center:
http://www.umsl.edu/services/itc/std_ptc.html
Ph: (314) 747-0294 or 747-1522

Medline - National Library of Medicine:
http://igm.nlm.nih.gov/

Diseases Characterized by Urethritis and Cervicitis

Management of Male Patients Who Have Urethritis 8

Management of Patients Who Have Nongonococcal Urethritis 9

Management of Patients Who Have Mucopurulent Cervititis (MPC) 10

Chlamydial Infection
- Chlamydial Infection in Adolescents and Adults 11
- Chlamydial Infecton in Infants 13
- Ophthalmia Neonatorum Caused by *C. trachomatis* 13
- Infant Pneumonia Caused by *C. trachomatis* 14
- Infants Born to Mothers Who Have Chlamydial Infection 14
- Chlamydial Infection in Children 14

Gonococcal Infection
- Gonococcal Infection in Adolescents and Adults 15
- Gonococal Infection in Infants 19
- Gonococcal Infection in Children 21
- Ophthalmia Neonatorum Prophylaxis 22

Diseases Characterized by Urethritis and Cervicitis

MANAGEMENT OF MALE PATIENTS WHO HAVE URETHRITIS

Urethritis, or inflammation of the urethra, is caused by an infection characterized by the discharge of mucopurulent or purulent material and by burning during urination. Asymptomatic infections are common. The only bacterial pathogens of proven clinical importance in men who have urethritis are *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. Testing to determine the specific disease is recommended because both of these infections are reportable to state health departments, and a specific diagnosis may improve compliance and partner notification. If diagnostic tools (e.g., a Gram stain and microscope) are unavailable, patients should be treated for both infections. The extra expense of treating a person who has nongonococcal urethritis (NGU) for both infections also should encourage the health-care provider to make a specific diagnosis. New nucleic acid amplification tests enable detection of *N. gonorrhoeae* and *C. trachomatis* on first-void urine; in some settings, these tests are more sensitive than traditional culture techniques.

Etiology

NGU is diagnosed if Gram-negative intracellular organisms cannot be identified on Gram stains. *C. trachomatis* is the most frequent cause (i.e., in 23%–55% of cases); however, the prevalence differs by age group, with lower prevalence among older men. The proportion of NGU cases caused by chlamydia has been declining gradually. Complications of NGU among men infected with *C. trachomatis* include epididymitis and Reiter's syndrome. Documentation of chlamydia infection is important because partner referral for evaluation and treatment would be indicated.

The etiology of most cases of nonchlamydial NGU is unknown. *Ureaplasma urealyticum* and possibly *Mycoplasma genitalium* are implicated in as many as one third of cases. Specific diagnostic tests for these organisms are not indicated.

Trichomonas vaginalis and HSV sometimes cause NGU. Diagnostic and treatment procedures for these organisms are reserved for situations in which NGU is nonresponsive to therapy.

Confirmed Urethritis

Clinicians should document that urethritis is present. Urethritis can be documented by the presence of any of the following signs:

a. Mucopurulent or purulent discharge.

b. Gram stain of urethral secretions demonstrating ≥5 WBCs per oil immersion field. The Gram stain is the preferred rapid diagnostic test for evaluating urethritis. It is highly sensitive and specific for documenting both urethritis and the presence or absence of gonococcal infection. Gonococcal infection is established by documenting the presence of WBCs containing intracellular Gram-negative diplococci.

c. Positive leukocyte esterase test on first-void urine, or microscopic examination of first-void urine demonstrating ≥10 WBCs per high power field.

If none of these criteria is present, then treatment should be deferred, and the patient should be tested for *N. gonorrhoeae* and *C. trachomatis* and followed closely in the event of a positive test result. If the results demonstrate infection with either *N. gonorrhoeae* or *C. trachomatis*, the appropriate treatment should be given and sex partners referred for evaluation and treatment.

Empiric treatment of symptoms without documentation of urethritis is recommended only for patients at high risk for infection who are unlikely to return for a follow-up evaluation (e.g., adolescents who have multiple partners). Such patients should be treated for gonorrhea and chlamydia. Partners of patients treated empirically should be referred for evaluation and treatment.

MANAGEMENT OF PATIENTS WHO HAVE NONGONOCOCCAL URETHRITIS

Diagnosis

All patients who have urethritis should be evaluated for the presence of gonococcal and chlamydial infection. Testing for chlamydia is strongly recommended because of the increased utility and availability of highly sensitive and specific testing methods and because a specific diagnosis might improve compliance and partner notification.

Treatment

Treatment should be initiated as soon as possible after diagnosis. Single-dose regimens have the important advantage of improved compliance and of directly observed therapy. If multiple-dose regimens are used, the medication should be provided in the clinic or health-care provider's office. Treatment with the recommended regimen can result in alleviation of symptoms and microbiologic cure of infection.

Recommended Regimens

Azithromycin 1 g orally in a single dose,

OR

Doxycycline 100 mg orally twice a day for 7 days.

Alternative Regimens

Erythromycin base 500 mg orally four times a day for 7 days

OR

Erythromycin ethylsuccinate 800 mg orally four times a day for 7 days,

OR

Ofloxacin 300 mg twice a day for 7 days.

If only erythromycin can be used and a patient cannot tolerate high-dose erythromycin schedules, one of the following regimens can be used:

Erythromycin base 250 mg orally four times a day for 14 days,

OR

Erythromycin ethylsuccinate 400 mg orally four times a day for 14 days.

Follow-Up for Patients Who Have Urethritis

Patients should be instructed to return for evaluation if symptoms persist or recur after completion of therapy. Symptoms alone, without documentation of signs or laboratory evidence of urethral inflammation, are not a sufficient basis for retreatment. Patients should be instructed to abstain from sexual intercourse until therapy is completed.

Partner Referral

Patients should refer for evaluation and treatment all sex partners within the preceding 60 days. A specific diagnosis may facilitate partner referral; therefore, testing for gonorrhea and chlamydia is encouraged.

Recurrent and Persistent Urethritis

Objective signs of urethritis should be present before initiation of antimicrobial therapy. Effective regimens have not been identified for treating patients who have persistent symptoms or frequent recurrences after treatment. Patients who have persistent or recurrent urethritis should be re-treated with the initial regimen if they did not comply with the treatment regimen or if they were reexposed to an untreated sex partner. Otherwise, a wet mount examination and culture of an intraurethral swab specimen for *T. vaginalis* should be performed. Urologic examinations usually do not reveal a specific etiology. If the patient was compliant with the initial regimen and reexposure can be excluded, the following regimen is recommended:

Recommended Treatment for Recurrent/Persistent Urethritis

Metronidazole 2 g orally in a single dose,

PLUS

Erythromycin base 500 mg orally four times a day for 7 days,

OR

Erythromycin ethylsuccinate 800 mg orally four times a day for 7 days.

Special Considerations

HIV Infection

Gonococcal urethritis, chlamydial urethritis, and nongoncoccal, nonchlamydial urethritis may facilitate HIV transmission. Patients who have NGU and also are infected with HIV should receive the same treatment regimen as those who are HIV-negative.

MANAGEMENT OF PATIENTS WHO HAVE MUCOPURULENT CERVICITIS

Mucopurulent cervicitis (MPC) is characterized by a purulent or mucopurulent endocervical exudate visible in the endocervical canal or in an endocervical swab specimen. Some experts also make the diagnosis on the basis of easily induced cervical bleeding. Although some experts consider an increased number of polymorphonuclear leukocytes on endocervical Gram stain as being useful in the diagnosis of MPC, this criterion has not been standardized, has a low positive-predictive value (PPV), and is not available in some settings. MPC often is asymptomatic, but some women have an abnormal vaginal discharge and vaginal bleeding (e.g., after sexual intercourse). MPC can be caused by *C. trachomatis* or *N. gonorrhoeae*; however, in most cases neither organism can be isolated. MPC can persist despite repeated courses of antimicrobial therapy. Because relapse or reinfection with *C. trachomatis* or *N. gonorrhoeae* usually does not apply to persistent cases of MPC, other nonmicrobiologic determinants (e.g., inflammation in an ectropion) could be involved.

Patients who have MPC should be tested for *C. trachomatis* and for *N. gonorrhoeae* by using the most sensitive and specific test for the population served. However, MPC is not a sensitive predictor of infection with these organisms, because most women who have *C. trachomatis* or *N. gonorrhoeae* do not have MPC.

Treatment

The results of sensitive tests for *C. trachomatis* or *N. gonorrhoeae* (e.g., culture or nucleic acid amplification tests) should determine the need for treatment, unless the likelihood of infection with either organism is high or the patient is unlikely to return for treatment. Empiric treatment should be considered for a patient who has a suspected case of gonorrhea and/or chlamydia if a) the prevalence of these diseases differs substantially (i.e., >15%) between clinics in the geographic area and b) the patient might be difficult to locate for treatment. After the possibilities of relapse and reinfection have been excluded, management of persistent MPC is unclear. For such cases, additional antimicrobial therapy may be of little benefit.

Follow-Up

Follow-up should be as recommended for the infections for which the woman is being treated. If symptoms persist, women should be instructed to return for reevaluation and to abstain from sexual intercourse even if they have completed the prescribed therapy.

Management of Sex Partners

Management of sex partners of women treated for MPC should be appropriate for the identified or suspected STD. Partners should be notified, examined, and treated for the STD identified or suspected in the index patient.

Patients should be instructed to abstain from sexual intercourse until they and their sex partners are cured. Because a microbiologic test of cure usually is not recommended, patients should abstain from sexual intercourse until therapy is completed (i.e., 7 days after a single-dose regimen or after completion of a 7-day regimen).

Special Considerations

HIV Infection

Patients who have MPC and also are infected with HIV should receive the same treatment regimen as those who are HIV-negative.

CHLAMYDIAL INFECTION

In the United States, chlamydial genital infection occurs frequently among sexually active adolescents and young adults. Asymptomatic infection is common among both men and women. Screening sexually active adolescents for chlamydial infection should be routine during annual examinations, even if symptoms are not present. Screening women aged 20–24 years also is suggested, particularly for those who have new or multiple sex partners and who do not consistently use barrier contraceptives.

Chlamydial Infection in Adolescents and Adults

Several important sequelae can result from *C. trachomatis* infection in women; the most serious of these include PID, ectopic pregnancy, and infertility. Some women who have apparently uncomplicated cervical infection already have subclinical upper reproductive tract infection. A recent investigation of patients in a health maintenance organization demonstrated that screening and treatment of cervical infection can reduce the likelihood of PID.

Treatment

Treatment of infected patients prevents transmission to sex partners; and, for infected pregnant women, treatment might prevent transmission of *C. trachomatis* to infants during birth. Treatment of sex partners helps to prevent reinfection of the index patient and infection of other partners.

Coinfection with *C. trachomatis* often occurs among patients who have gonococcal infection; therefore, presumptive treatment of such patients for chlamydia is appropriate (see Gonococcal Infection, Dual Therapy for Gonococcal and Chlamydial Infections). The following recommended treatment regimens and the alternative regimens cure infection and usually relieve symptoms.

Recommended Regimens

Azithromycin 1 g orally in a single dose,

OR

Doxycycline 100 mg orally twice a day for 7 days.

Alternative Regimens

Erythromycin base 500 mg orally four times a day for 7 days,

OR

Erythromycin ethylsuccinate 800 mg orally four times a day for 7 days,

OR

Ofloxacin 300 mg orally twice a day for 7 days.

The results of clinical trials indicate that azithromycin and doxycycline are equally efficacious. These investigations were conducted primarily in populations in which follow-up was encouraged and adherence to a 7-day regimen was good. Azithromycin should always be available to health-care providers to treat at least those patients for whom compliance is in question.

In populations with erratic health-care-seeking behavior, poor compliance with treatment, or minimal follow-up, azithromycin may be more cost-effective because it provides single-dose, directly observed therapy. Doxycycline costs less than azithromycin, and it has been used extensively for a longer period. Erythromycin is less efficacious than either azithromycin and doxycycline, and gastrointestinal side effects frequently discourage patients from complying with this regimen. Ofloxacin is similar in efficacy to doxycycline and azithromycin, but it is more expensive to use and offers no advantage with regard to the dosage regimen. Other quinolones either are not reliably effective against chlamydial infection or have not been adequately evaluated.

To maximize compliance with recommended therapies, medications for chlamydial infections should be dispensed on site, and the first dose should be directly observed. To minimize further transmission of infection, patients treated for chlamydia should be instructed to abstain from sexual intercourse for 7 days after single-dose therapy or until completion of a 7-day regimen. Patients also should be instructed to abstain from sexual intercourse until all of their sex partners are cured to minimize the risk for reinfection.

Follow-Up

Patients do not need to be retested for chlamydia after completing treatment with doxycycline or azithromycin unless symptoms persist or reinfection is suspected, because these therapies are highly efficacious. A test of cure may be considered 3 weeks after completion of treatment with erythromycin. The validity of chlamydial culture testing at <3 weeks after completion of therapy to identify patients who did not respond to therapy has not been established. False-negative results can occur because of small numbers of chlamydial organisms. In addition, nonculture tests conducted at <3 weeks after completion of therapy for patients who were treated successfully could be false-positive because of continued excretion of dead organisms.

Some studies have demonstrated high rates of infection among women retested several months after treatment, presumably because of reinfection. In some populations (e.g., adolescents), rescreening women several months after treatment might be effective for detecting further morbidity.

Management of Sex Partners

Patients should be instructed to refer their sex partners for evaluation, testing, and treatment. Because exposure intervals have received limited evaluation, the following recommendations are somewhat arbitrary. Sex partners should be evaluated, tested, and treated if they had sexual contact with the patient during the 60 days preceding onset of symptoms in the patient or diagnosis of chlamydia. Health-care providers should treat the most recent sex partner even if the time of the last sexual contact was >60 days before onset or diagnosis.

Patients should be instructed to abstain from sexual intercourse until they and their sex partners have completed treatment. Because a microbiologic test of cure usually is not recommended, abstinence should be continued until therapy is completed (i.e., 7 days after a single-dose regimen or after completion of a 7-day regimen). Timely treatment of sex partners is essential for decreasing the risk for reinfecting the index patient.

Special Considerations

Pregnancy

Doxycycline and ofloxacin are contraindicated for pregnant women. The safety and efficacy of azithromycin use in pregnant and lactating women have not been established. Repeat testing, preferably by culture, 3 weeks after completion of therapy with the following regimens is recommended, because a) none of these regimens are highly efficacious and b) the frequent side effects of erythromycin might discourage patient compliance with this regimen.

Recommended Regimens for Pregnant Women

Erythromycin base 500 mg orally four times a day for 7 days,

OR

Amoxicillin 500 mg orally three times a day for 7 days.

Alternative Regimens for Pregnant Women

Erythromycin base 250 mg orally four times a day for 14 days,

OR

Erythromycin ethylsuccinate 800 mg orally four times a day for 7 days,

OR

Erythromycin ethylsuccinate 400 mg orally four times a day for 14 days,

OR

Azithromycin 1 g orally in a single dose.

Note: Erythromycin estolate is contraindicated during pregnancy because of drug-related hepatotoxicity. Preliminary data indicate that azithromycin may be safe and effective. However, data are insufficient to recommend the routine use of azithromycin in pregnant women.

HIV Infection
Patients who have chlamydial infection and also are infected with HIV should receive the same treatment regimen as those who are HIV-negative.

Chlamydial Infection in Infants

Prenatal screening of pregnant women can prevent chlamydial infection among neonates. Pregnant women who are <25 years of age or who have new or multiple sex partners particularly should be targeted for screening. Periodic prevalence surveys of chlamydial infection can be conducted to confirm the validity of using these recommendations in specific clinical settings.

C. trachomatis infection of neonates results from perinatal exposure to the mother's infected cervix. The prevalence of *C. trachomatis* infection among pregnant women usually is >5%, regardless of race/ethnicity or socioeconomic status. Neonatal ocular prophylaxis with silver nitrate solution or antibiotic ointments does not prevent perinatal transmission of *C. trachomatis* from mother to infant. However, ocular prophylaxis with those agents does prevent gonoccocal ophthalmia and should be continued for that reason (see Prevention of Ophthalmia Neonatorum).

Initial *C. trachomatis* perinatal infection involves mucous membranes of the eye, oropharynx, urogenital tract, and rectum. *C. trachomatis* infection in neonates is most often recognized by conjunctivitis that develops 5–12 days after birth. Chlamydia is the most frequent identifiable infectious cause of ophthalmia neonatorum. *C. trachomatis* also is a common cause of subacute, afebrile pneumonia with onset from 1 to 3 months of age. Asymptomatic infections also can occur in the oropharynx, genital tract, and rectum of neonates.

Ophthalmia Neonatorum Caused by *C. trachomatis*

A chlamydial etiology should be considered for all infants aged ≤30 days who have conjunctivitis.

Diagnostic Considerations

Sensitive and specific methods used to diagnose chlamydial ophthalmia in the neonate include both tissue culture and nonculture tests (e.g., direct fluorescent antibody tests and immunoassays). Giemsa-stained smears are specific for *C. trachomatis*, but such tests are not sensitive. Specimens must contain conjunctival cells, not exudate alone. Specimens for culture isolation and nonculture tests should be obtained from the everted eyelid using a dacron-tipped swab or the swab specified by the manufacturer's test kit. A specific diagnosis of *C. trachomatis* infection confirms the need for treatment not only for the neonate, but also for the mother and her sex partner(s). Ocular exudate from infants being evaluated for chlamydial conjunctivitis also should be tested for *N. gonorrhoeae*.

Recommended Regimen
Erythromycin 50 mg/kg/day orally divided into four doses daily for 10–14 days.

Topical antibiotic therapy alone is inadequate for treatment of chlamydial infection and is unnecessary when systemic treatment is administered.

Follow-Up

The efficacy of erythromycin treatment is approximately 80%; a second course of therapy may be required. Follow-up of infants to determine resolution is recommended. The possibility of concomitant chlamydial pneumonia should be considered.

Management of Mothers and Their Sex Partners

The mothers of infants who have chlamydial infection and the sex partners of these women should be evaluated and treated (see Chlamydial Infection in Adolescents and Adults).

Infant Pneumonia Caused by *C. trachomatis*

Characteristic signs of chlamydial pneumonia in infants include a) a repetitive staccato cough with tachypnea and b) hyperinflation and bilateral diffuse infiltrates on a chest radiograph. Wheezing is rare, and infants are typically afebrile. Peripheral eosinophilia sometimes occurs in infants who have chlamydial pneumonia. Because clinical presentations differ, initial treatment and diagnostic tests should encompass *C. trachomatis* for all infants aged 1–3 months who possibly have pneumonia.

Diagnostic Considerations

Specimens for chlamydial testing should be collected from the nasopharynx. Tissue culture is the definitive standard for chlamydial pneumonia; nonculture tests can be used with the knowledge that nonculture tests of nasopharyngeal specimens produce lower sensitivity and specificity than nonculture tests of ocular specimens. Tracheal aspirates and lung biopsy specimens, if collected, should be tested for *C. trachomatis*.

The microimmunofluorescence test for *C. trachomatis* antibody is useful but not widely available. An acute IgM antibody titer ≥1:32 is strongly suggestive of *C. trachomatis* pneumonia.

Because of the delay in obtaining test results for chlamydia, the decision to include an agent in the antibiotic regimen that is active against *C. trachomatis* must frequently be based on the clinical and radiologic findings. The results of tests for chlamydial infection assist in the management of an infant's illness and determine the need for treating the mother and her sex partner(s).

Recommended Regimen

Erythromycin base 50 mg/kg/day orally divided into four doses daily for 10–14 days.

Follow-Up

The effectiveness of erythromycin treatment is approximately 80%; a second course of therapy may be required. Follow-up of infants is recommended to determine whether the pneumonia has resolved. Some infants with chlamydial pneumonia have had abnormal pulmonary function tests later in childhood.

Management of Mothers and Their Sex Partners

Mothers of infants who have chlamydial infection and the sex partners of these women should be evaluated and treated according to the recommended treatment of adults for chlamydial infections (see Chlamydial Infection in Adolescents and Adults).

Infants Born to Mothers Who Have Chlamydial Infection

Infants born to mothers who have untreated chlamydia are at high risk for infection; however, prophylatic antibiotic treatment is not indicated, and the efficacy of such treatment is unknown. Infants should be monitored to ensure appropriate treatment if infection develops.

Chlamydial Infection in Children

Sexual abuse must be considered a cause of chlamydial infection in preadolescent children, although perinatally transmitted *C. trachomatis* infection of the nasopharynx, urogenital tract, and rectum may persist for >1 year (see Sexual Assault or Abuse of Children). Because of the potential for a criminal investigation and legal proceedings for sexual abuse, a diagnosis of *C. trachomatis* in a preadolescent child requires the high specificity provided by isolation in cell culture. The cultures should be confirmed by microscopic identification of the characteristic intracytoplasmic inclusions, preferably by fluorescein-conjugated monoclonal antibodies specific for *C. trachomatis*.

Diagnostic Considerations

Nonculture tests for chlamydia should not be used because of the possibility of false-positive test results. With respiratory tract specimens, false-positive results can occur because of cross-reaction of test reagents with *Chlamydia pneumoniae*; with genital and anal specimens, false-positive results occur because of cross-reaction with fecal flora.

Recommended Regimens

Children who weigh <45 kg:

Erythromycin base 50 mg/kg/day orally divided into four doses daily for 10–14 days.

NOTE: The effectiveness of treatment with erythromycin is approximately 80%; a second course of therapy may be required.

Children who weigh ≥45 kg but are <8 years of age:

Azithromycin 1 g orally in a single dose.

Children ≥8 years of age:

Azithromycin 1 g orally in a single dose,

OR

Doxycycline 100 mg orally twice a day for 7 days.

Other Management Considerations

See Sexual Assault or Abuse of Children.

Follow-Up

Follow-up cultures are necessary to ensure that treatment has been effective.

GONOCOCCAL INFECTION

Gonococcal Infection in Adolescents and Adults

In the United States, an estimated 600,000 new infections with *N. gonorrhoeae* occur each year. Most infections among men produce symptoms that cause them to seek curative treatment soon enough to prevent serious sequelae—but this may not be soon enough to prevent transmission to others. Many infections among women do not produce recognizable symptoms until complications (e.g., pelvic inflammatory disease [PID]) have occurred. Both symptomatic and asymptomatic cases of PID can result in tubal scarring that leads to infertility or ectopic pregnancy. Because gonococcal infections among women often are asymptomatic, an important component of gonorrhea control in the United States continues to be the screening of women at high risk for STDs.

Dual Therapy for Gonococcal and Chlamydial Infections

Patients infected with *N. gonorrhoeae* often are coinfected with *C. trachomatis*; this finding led to the recommendation that patients treated for gonococcal infection also be treated routinely with a regimen effective against uncomplicated genital *C. trachomatis* infection. Routine dual therapy without testing for chlamydia can be cost-effective for populations in which chlamydial infection accompanies 20%–40% of gonococcal infections, because the cost of therapy for chlamydia (e.g., $0.50–$1.50 for doxycycline) is less than the cost of testing. Some experts believe that the routine use of dual therapy has resulted in substantial decreases in the prevalence of chlamydial infection. Because most gonococci in the United States are susceptible to doxycycline and azithromycin, routine cotreatment might hinder the development of antimicrobial-resistant *N. gonorrhoeae*.

Since the introduction of dual therapy, the prevalence of chlamydial infection has decreased in some populations, and simultaneous testing for chlamydial infection has become quicker, more sensitive, and more widely available. In geographic areas in which the rates of coinfection are low, some clinicians might prefer to test for chlamydia rather than treat presumptively. However, presumptive treatment is indicated for patients who may not return for test results.

Quinolone-Resistant N. gonorrhoeae (QRNG)

Cases of gonorrhea caused by *N. gonorrhoeae* resistant to fluoroquinolones have been reported sporadically from many parts of the world, including North America, and are becoming widespread in parts of Asia. As of February 1997, however, QRNG occurred rarely in the United States: <0.05% of 4,639 isolates collected by CDC's Gonococcal Isolate Surveillance Project (GISP) during 1996 had minimum inhibitory concentrations (MICs) ≥1.0 mg/mL to ciprofloxacin. The GISP sample is collected from 26 cities and includes approximately 1.3% of all reported gonococcal infections among

men in the United States. As long as QRNG strains comprise <1% of all *N. gonorrhoeae* strains isolated at each of the 26 cities, the fluoroquinolone regimens can be used with confidence. However, importation of QRNG will probably continue, and the prevalence of QRNG in the United States could increase to the point that fluoroquinolones no longer reliably eradicate gonococcal infections.

Uncomplicated Gonococcal Infections of the Cervix, Urethra, and Rectum

Recommended Regimens

Cefixime 400 mg orally in a single dose,

OR

Ceftriaxone 125 mg IM in a single dose,

OR

Ciprofloxacin 500 mg orally in a single dose,

OR

Ofloxacin 400 mg orally in a single dose,

PLUS

Azithromycin 1 g orally in a single dose,

OR

Doxycycline 100 mg orally twice a day for 7 days.

Cefixime has an antimicrobial spectrum similar to that of ceftriaxone, but the 400-mg oral dose does not provide as high nor as sustained a bactericidal level as that provided by the 125-mg dose of ceftriaxone. In published clinical trials, the 400-mg dose cured 97.1% of uncomplicated urogenital and anorectal gonococcal infections. The advantage of cefixime is that it can be administered orally.

Ceftriaxone in a single injection of 125 mg provides sustained, high bactericidal levels in the blood. Extensive clinical experience indicates that ceftriaxone is safe and effective for the treatment of uncomplicated gonorrhea at all sites, curing 99.1% of uncomplicated urogenital and anorectal infections in published clinical trials.

Ciprofloxacin is effective against most strains of *N. gonorrhoeae*. At a dose of 500 mg, ciprofloxacin provides sustained bactericidal levels in the blood; in published clinical trials, it has cured 99.8% of uncomplicated urogenital and anorectal infections. Ciprofloxacin is safe, relatively inexpensive, and can be administered orally.

Ofloxacin also is effective against most strains of *N. gonorrhoeae*, and it has favorable pharmacokinetics. The 400-mg oral dose has been effective for treatment of uncomplicated urogenital and anorectal infections, curing 98.4% of infections in published clinical trials.

Alternative Regimens

Spectinomycin 2 g IM in a single dose. Spectinomycin is expensive and must be injected; however, it has been effective in published clinical trials, curing 98.2% of uncomplicated urogenital and anorectal gonococcal infections. Spectinomycin is useful for treatment of patients who cannot tolerate cephalosporins and quinolones.

Single-dose cephalosporin regimens other than ceftriaxone 125 mg IM and cefixime 400 mg orally that are safe and highly effective against uncomplicated urogenital and anorectal gonococcal infections include a) ceftizoxime 500 mg IM, b) cefotaxime 500 mg IM, c) cefotetan 1 g IM, and d) cefoxitin 2 g IM with probenecid 1 g orally. None of these injectable cephalosporins offers any advantage in comparison with ceftriaxone, and clinical experience with these regimens for treatment of uncomplicated gonorrhea is limited.

Single-dose quinolone regimens include enoxacin 400 mg orally, lomefloxacin 400 mg orally, and norfloxacin 800 mg orally. These regimens appear to be safe and effective for the treatment of uncomplicated gonorrhea, but data regarding their use are limited. None of the regimens appears to offer any advantage over ciprofloxacin at a dose of 500 mg or ofloxacin at 400 mg.

Many other antimicrobials are active against *N. gonorrhoeae*; however, these guidelines are not intended to be a comprehensive list of all effective treatment regimens. Azithromycin 2 g orally is effective against uncomplicated gonococcal infection, but it is expensive and causes gastrointestinal distress too often to be recommended for treatment of gonorrhea. At an oral dose of 1 g, azithromycin is insufficiently effective, curing only 93% of patients in published studies.

Uncomplicated Gonococcal Infection of the Pharynx

Gonococcal infections of the pharynx are more difficult to eradicate than infections at urogenital and anorectal sites. Few antigonococcal regimens can reliably cure such infections >90% of the time.

Although chlamydial coinfection of the pharynx is unusual, coinfection at genital sites sometimes occurs. Therefore, treatment for both gonorrhea and chlamydia is suggested.

Recommended Regimens

Ceftriaxone 125 mg IM in a single dose,

OR

Ciprofloxacin 500 mg orally in a single dose,

OR

Ofloxacin 400 mg orally in a single dose,

PLUS

Azithromycin 1 g orally in a single dose,

OR

Doxycycline 100 mg orally twice a day for 7 days.

Follow-Up

Patients who have uncomplicated gonorrhea and who are treated with any of the recommended regimens need not return for a test of cure. Patients who have symptoms that persist after treatment should be evaluated by culture for *N. gonorrhoeae*, and any gonococci isolated should be tested for antimicrobial susceptibility. Infections identified after treatment with one of the recommended regimens usually result from reinfection rather than treatment failure, indicating a need for improved patient education and referral of sex partners. Persistent urethritis, cervicitis, or proctitis also may be caused by *C. trachomatis* and other organisms.

Management of Sex Partners

Patients should be instructed to refer sex partners for evaluation and treatment. All sex partners of patients who have *N. gonorrhoeae* infection should be evaluated and treated for *N. gonorrhoeae* and *C. trachomatis* infections if their last sexual contact with the patient was within 60 days before onset of symptoms or diagnosis of infection in the patient. If a patient's last sexual intercourse was >60 days before onset of symptoms or diagnosis, the patient's most recent sex partner should be treated. Patients should be instructed to avoid sexual intercourse until therapy is completed and they and their sex partners no longer have symptoms.

Special Considerations

Allergy, Intolerance, or Adverse Reactions

Persons who cannot tolerate cephalosporins or quinolones should be treated with spectinomycin. Because spectinomycin is unreliable (i.e., only 52% effective) against pharyngeal infections, patients who have suspected or known pharyngeal infection should have a pharyngeal culture evaluated 3–5 days after treatment to verify eradication of infection.

Pregnancy

Pregnant women should not be treated with quinolones or tetracyclines. Those infected with *N. gonorrhoeae* should be treated with a recommended or alternate cephalosporin. Women who cannot tolerate a cephalosporin should be administered a single 2-g dose of spectinomycin IM. Either erythromycin or amoxicillin is recommended for treatment of presumptive or diagnosed *C. trachomatis* infection during pregnancy (see Chlamydial Infection).

HIV Infection

Patients who have gonococcal infection and also are infected with HIV should receive the same treatment regimen as those who are HIV-negative.

Gonococcal Conjunctivitis

Only one study of the treatment of gonococcal conjunctivitis among adults in North America has been published recently. In that study, 12 of 12 patients responded favorably to a single 1-g IM injection of ceftriaxone. The following recommendations reflect the opinions of expert consultants.

Treatment

Recommended Regimen

Ceftriaxone 1 g IM in a single dose, and lavage the infected eye with saline solution once.

Management of Sex Partners

Patients should be instructed to refer their sex partners for evaluation and treatment (see Gonococcal Infection, Management of Sex Partners).

Disseminated Gonococcal Infection (DGI)

DGI results from gonococcal bacteremia. DGI often results in petechial or pustular acral skin lesions, asymmetrical arthralgia, tenosynovitis, or septic arthritis. The infection is complicated occasionally by perihepatitis, and rarely by endocarditis or meningitis. Strains of *N. gonorrhoeae* that cause DGI tend to cause minimal genital inflammation. In the United States, these strains have occurred infrequently during the past decade.

No studies of the treatment of DGI among persons in North America have been published recently. The following recommendations reflect the opinions of experts. No treatment failures have been reported.

Treatment

Hospitalization is recommended for initial therapy, especially for patients who cannot be relied on to comply with treatment, for those in whom the diagnosis is uncertain, and for those who have purulent synovial effusions or other complications. Patients should be examined for clinical evidence of endocarditis and meningitis. Patients treated for DGI should be treated presumptively for concurrent *C. trachomatis* infection unless appropriate testing excludes this infection.

Recommended Initial Regimen

Ceftriaxone 1 g IM or IV every 24 hours.

Alternative Initial Regimens

Cefotaxime 1 g IV every 8 hours,

OR

Ceftizoxime 1 g IV every 8 hours,

OR

For persons allergic to ß-lactam drugs:

Ciprofloxacin 500 mg IV every 12 hours,

OR

Ofloxacin 400 mg IV every 12 hours,

OR

Spectinomycin 2 g IM every 12 hours.

All regimens should be continued for 24–48 hours after improvement begins, at which time therapy may be switched to one of the following regimens to complete a full week of antimicrobial therapy:

Cefixime 400 mg orally twice a day,

OR

Ciprofloxacin 500 mg orally twice a day,

OR

Ofloxacin 400 mg orally twice a day.

Management of Sex Partners

Gonococcal infection often is asymptomatic in sex partners of patients who have DGI. As with uncomplicated gonococcal infections, patients should be instructed to refer their sex partners for evaluation and treatment (see Gonococcal Infection, Management of Sex Partners).

Gonococcal Meningitis and Endocarditis

Recommended Initial Regimen
Ceftriaxone 1–2 g IV every 12 hours.

Therapy for meningitis should be continued for 10–14 days; therapy for endocarditis should be continued for at least 4 weeks. Treatment of complicated DGI should be undertaken in consultation with an expert.

Management of Sex Partners

Patients should be instructed to refer their sex partners for evaluation and treatment (see Gonococcal Infection, Management of Sex Partners).

Gonococcal Infection in Infants

Gonococcal infection usually results from exposure to infected cervical exudate at birth. It is usually an acute illness that becomes manifest 2–5 days after birth. The prevalence of infection among infants depends on the prevalence of infection among pregnant women, on whether pregnant women are screened for gonorrhea, and on whether newborns receive ophthalmia prophylaxis.

The most serious manifestations of *N. gonorrhoeae* infection in newborns are ophthalmia neonatorum and sepsis, including arthritis and meningitis. Less serious manifestations include rhinitis, vaginitis, urethritis, and inflammation at sites of fetal monitoring.

Ophthalmia Neonatorum Caused by N. gonorrhoeae

Although *N. gonorrhoeae* is a less frequent cause of ophthalmia neonatorum in the United States than *C. trachomatis* and nonsexually transmitted agents, it is especially important because it may result in perforation of the globe of the eye and in blindness.

Diagnostic Considerations

Infants at increased risk for gonococcal ophthalmia are those who do not receive ophthalmia prophylaxis and those whose mothers have had no prenatal care or whose mothers have a history of STDs or substance abuse. Gonococcal ophthalmia is strongly suggested when typical Gram-negative diplococci are identified in conjunctival exudate, justifying presumptive treatment for gonorrhea after appropriate cultures for *N. gonorrhoeae* are obtained. Appropriate chlamydial testing should be done simultaneously. Presumptive treatment for *N. gonorrhoeae* may be indicated for newborns who are at increased risk for gonococcal ophthalmia and who have conjunctivitis but do not have gonococci in a Gram-stained smear of conjunctival exudate.

In all cases of neonatal conjunctivitis, conjunctival exudate should be cultured for *N. gonorrhoeae* and tested for antibiotic susceptibility before a definitive diagnosis is made. A definitive diagnosis is important because of the public health and social consequences of a diagnosis of gonorrhea. Nongonococcal causes of neonatal ophthalmia include *Moraxella catarrhalis* and other *Neisseria* species that are indistinguishable from *N. gonorrhoeae* on Gram-stained smear but can be differentiated in the microbiology laboratory.

Recommended Regimen
Ceftriaxone 25–50 mg/kg IV or IM in a single dose, not to exceed 125 mg.

NOTE: Topical antibiotic therapy alone is inadequate and is unnecessary if systemic treatment is administered.

Other Management Considerations
Simultaneous infection with *C. trachomatis* should be considered when a patient does not respond satisfactorily to treatment. Both mother and infant should be tested for chlamydial infection at the same time that gonorrhea testing is done (see Ophthalmia Neonatorum Caused by *C. trachomatis*). Ceftriaxone should be administered cautiously to hyperbilirubinemic infants, especially those born prematurely.

Follow-Up
Infants who have gonococcal ophthalmia should be hospitalized and evaluated for signs of disseminated infection (e.g., sepsis, arthritis, and meningitis). One dose of ceftriaxone is adequate therapy for gonococcal conjunctivitis, but many pediatricians prefer to continue antibiotics until cultures are negative at 48–72 hours. The duration of therapy should be decided in consultation with experienced physicians.

Management of Mothers and Their Sex Partners
The mothers of infants who have gonococcal infection and the mothers' sex partners should be evaluated and treated according to the recommendations for treating gonococcal infections in adults (see Gonococcal Infection in Adolescents and Adults).

Disseminated Gonococcal Infection and Gonococcal Scalp Abscess in Newborns

Sepsis, arthritis, meningitis, or any combination of these are rare complications of neonatal gonococcal infection. Localized gonococcal infection of the scalp might result from fetal monitoring through scalp electrodes. Detection of gonococcal infection in neonates who have sepsis, arthritis, meningitis, or scalp abscesses requires cultures of blood, CSF, and joint aspirate on chocolate agar. Specimens obtained from the conjunctiva, vagina, oropharynx, and rectum that are cultured on gonococcal selective medium are useful for identifying the primary site(s) of infection, especially if inflammation is present. Positive Gram-stained smears of exudate, CSF, or joint aspirate provide a presumptive basis for initiating treatment for *N. gonorrhoeae*. Diagnoses based on Gram-stained smears or presumptive identification of cultures should be confirmed with definitive tests on culture isolates.

Recommended Regimens
Ceftriaxone 25–50 mg/kg/day IV or IM in a single daily dose for 7 days,
with a duration of 10–14 days if meningitis is documented;
OR
Cefotaxime 25 mg/kg IV or IM every 12 hours for 7 days,
with a duration of 10–14 days if meningitis is documented.

Prophylactic Treatment for Infants Whose Mothers Have Gonococcal Infection

Infants born to mothers who have untreated gonorrhea are at high risk for infection.

Recommended Regimen in the Absence of Signs of Gonococcal Infection
Ceftriaxone 25–50 mg/kg IV or IM, not to exceed 125 mg, in a single dose.

Other Management Considerations

Mother and infant should be tested for chlamydial infection.

Follow-Up

A follow-up examination is not required.

Management of Mothers and Their Sex Partners

The mothers of infants who have gonococcal infection and the mothers' sex partners should be evaluated and treated according to the recommendations for treatment of gonococcal infections in adults (see Gonococcal Infection).

Gonococcal Infection in Children

After the neonatal period, sexual abuse is the most frequent cause of gonococcal infection in preadolescent children (see Sexual Assault or Abuse of Children). Vaginitis is the most common manifestation of gonococcal infection in preadolescent children. PID following vaginal infection is probably less common than among adults. Among sexually abused children, anorectal and pharyngeal infections with *N. gonorrhoeae* are common and frequently asymptomatic.

Diagnostic Considerations

Because of the legal implications of a diagnosis of *N. gonorrhoeae* infection in a child, only standard culture procedures for the isolation of *N. gonorrhoeae* should be used for children. Nonculture gonococcal tests for gonococci (e.g., Gram-stained smear, DNA probes, and EIA tests) should not be used alone; none of these tests have been approved by FDA for use with specimens obtained from the oropharynx, rectum, or genital tract of children. Specimens from the vagina, urethra, pharynx, or rectum should be streaked onto selective media for isolation of *N. gonorrhoeae,* and all presumptive isolates of *N. gonorrhoeae* should be identified definitively by at least two tests that involve different principles (e.g., biochemical, enzyme substrate, or serologic). Isolates should be preserved to enable additional or repeated testing.

Recommended Regimens for Children Who Weigh ≥45 kg

Children who weigh ≥45 kg should be treated with one of the regimens recommended for adults (see Gonococcal Infection).

NOTE: Quinolones are not approved for use in children because of concerns about toxicity based on animal studies. However, investigations of ciprofloxacin treatment in children who have cystic fibrosis demonstrated no adverse effects.

Recommended Regimen for Children Who Weigh <45 kg and Who Have Uncomplicated Gonococcal Vulvovaginitis, Cervicitis, Urethritis, Pharyngitis, or Proctitis

Ceftriaxone 125 mg IM in a single dose.

Alternative Regimen

Spectinomycin 40 mg/kg (maximum dose: 2 g) IM in a single dose may be used, but this therapy is unreliable for treatment of pharyngeal infections. Some experts use cefixime to treat gonococcal infections in children because it can be administered orally; however, no reports have been published concerning the safety or effectiveness of cefixime used for this purpose.

Recommended Regimen for Children Who Weigh <45 kg and Who Have Bacteremia or Arthritis

Ceftriaxone 50 mg/kg (maximum dose: 1 g) IM or IV in a single dose daily for 7 days.

Recommended Regimen for Children Who Weigh ≥45 kg and Who Have Bacteremia or Arthritis

Ceftriaxone 50 mg/kg (maximum dose: 2 g) IM or IV in a single dose daily for 10–14 days.

Follow-Up

Follow-up cultures are unnecessary if ceftriaxone is used. If spectinomycin is used to treat pharyngitis, a follow-up culture is necessary to ensure that treatment was effective.

Other Management Considerations

Only parenteral cephalosporins are recommended for use in children. Ceftriaxone is approved for all gonococcal infections in children; cefotaxime is approved for gonococcal ophthalmia only. Oral cephalosporins used for treatment of gonococcal infections in children have not been evaluated adequately.

All children who have gonococcal infections should be evaluated for coinfection with syphilis and *C. trachomatis*. For a discussion of concerns regarding sexual assault, refer to Sexual Assault or Abuse of Children.

Ophthalmia Neonatorum Prophylaxis

Instillation of a prophylactic agent into the eyes of all newborn infants is recommended to prevent gonococcal ophthalmia neonatorum; this procedure is required by law in most states [including Missouri]. All the recommended prophylactic regimens in this section prevent gonococcal ophthalmia. However, the efficacy of these preparations in preventing chlamydial ophthalmia is less clear, and they do not eliminate nasopharyngeal colonization by *C. trachomatis*. The diagnosis and treatment of gonococcal and chlamydial infections in pregnant women is the best method for preventing neonatal gonococcal and chlamydial disease. Not all women, however, receive prenatal care; and ocular prophylaxis is warranted because it can prevent sight-threatening gonococcal ophthalmia and it is safe, easy to administer, and inexpensive.

Prophylaxis

Recommended Regimens

Silver nitrate (1%) aqueous solution in a single application,

OR

Erythromycin (0.5%) ophthalmic ointment in a single application,

OR

Tetracycline ophthalmic ointment (1%) in a single application.

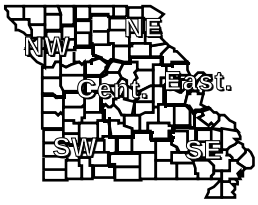
One of these recommended preparations should be instilled into both eyes of every neonate as soon as possible after delivery. If prophylaxis is delayed (i.e., not administered in the delivery room), a monitoring system should be established to ensure that all infants receive prophylaxis. All infants should be administered ocular prophylaxis, regardless of whether delivery is vaginal or cesarian. Single-use tubes or ampules are preferable to multiple-use tubes. Bacitracin is not effective. Povidone iodine has not been studied adequately.

Medical providers play a vital role in the prevention and control of sexually transmitted diseases (STDs). Providers can help significantly reduce the occurrence of these diseases by:

- **Evaluating each patient, as appropriate, for evidence of STDs, and for evidence of high-risk sexual behaviors.**
- **Promptly diagnosing and treating patients with STDs according to current guidelines.**
- **Providing appropriate follow-up after patients have been treated.**
- **Providing education and counseling to patients engaging in high-risk sexual behaviors.**
- **Promptly reporting, as required by Missouri law, all cases of chlamydial infection, gonorrhea, syphilis, and hepatitis B to the local health department, or to the Missouri Department of Health (DOH) at (573) 751-6463. Reports of cases of HIV infection/AIDS should be made as follows:**
  - **-Health care providers in St. Louis City and St. Louis County should report the individual to the St. Louis City Department of Health and Hospitals at (314) 658-1159.**
  - **-Providers in the five-county Kansas City metropolitan area should report to the Kansas City Health Department at (816) 983-4200.**
  - **-All other providers should report to DOH's Office of Surveillance at (573) 751-6463.**

It should be emphasized that the reporting of diagnosed cases of STDs to public health officials has important benefits. Such reporting provides specially trained public health professionals the opportunity to offer any needed assistance with partner elicitation and notification. By notifying an infected patient's sexual partners, additional infected persons can be identified and receive appropriate treatment and counseling. This will result in decreased morbidity and prevention of further transmission of infection. It is important to remember that with diseases such as gonorrhea, syphilis, and chlamydia, treatment of all sexual partners is essential to preventing reinfection of the index patient.

The reporting of STDs also allows public health officials to maintain an accurate understanding of current patterns and future trends for these diseases. Such an understanding is necessary in order to evaluate and plan prevention programs, and to obtain necessary resources to help prevent and treat these diseases. In addition, information on the occurrence of STDs in a given area can be of assistance to local medical providers with regard to certain diagnostic and treatment decisions they must make with their patients.



Missouri Department of Health
Division of Environmental Health and Communicable Disease Prevention
QUARTERLY REPORT

Reporting Period *
July - September, 1997

	Districts							KANSAS CITY	ST. LOUIS CITY	ST. LOUIS CO.	SPGFLD GREENE CO.	3 MONTH STATE TOTALS		CUMULATIVE		
	** NW	NE	CD	SE	** SW	** ED	*** OTHER					FOR 1997	FOR 1996	FOR 1997	FOR 1996	5 YR MEDIAN
Vaccine Preventable Dis.																
Diphtheria	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Hib Meningitis	0	0	0	0	0	0		0	0	0	0	0	0	0	0	7
Hib Other Invasive	0	0	0	0	0	0		0	0	0	1	1	2	4	7	26
Influenza	0	0	0	0	0	0		0	0	0	0	0	2	227	157	163
Measles	0	0	0	0	0	0		0	0	0	0	0	1	0	3	1
Mumps	0	0	0	0	0	0		0	0	0	0	0	4	0	6	26
Pertussis	2	0	5	2	3	3		4	2	0	0	21	20	50	35	42
Polio	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Rubella	0	0	0	0	0	0		0	0	0	0	0	0	0	0	1
Tetanus	0	0	0	0	0	0		0	0	0	0	0	0	0	1	0
Viral Hepatitis																
A	71	15	17	11	78	18		8	8	4	76	306	391	858	902	902
B	3	0	3	2	11	6		3	6	3	7	44	68	240	220	368
Non A - Non B	0	0	0	0	0	0		0	0	0	0	0	7	1	19	19
Unspecified	0	0	0	0	0	0		0	0	0	0	0	0	1	0	1
Meningitis																
Meningococcal	1	1	2	0	0	1		0	2	0	2	9	10	57	45	36
Enteric Infections																
Campylobacter	7	11	22	19	20	22		11	10	34	23	179	201	434	444	480
Salmonella	16	1	11	27	18	5		5	3	13	9	108	183	421	414	414
Shigella	7	3	4	20	3	0		2	3	9	1	52	87	176	312	507
Typhoid Fever	0	0	0	0	0	0		0	0	1	0	1	1	1	2	2
Parasitic Infections																
Giardiasis	21	7	40	25	27	25		11	38	35	9	238	239	520	543	512
Sexually Transmitted Dis.																
AIDS	12	0	7	11	4	5	15	32	37	21	3	147	216	349	598	216
Gonorrhea	43	13	93	112	55	23		287	817	373		1816	2117	5539	6310	12555
Prim. & Sec. syphilis	1	0	1	9	0	1		0	20	8		40	40	91	183	987
Tuberculosis																
Extrapulmonary	2	0	2	3	0	1	0	3	2	1	0	14	14	34	26	14
Pulmonary	4	1	3	7	8	1	0	12	10	8	0	54	47	134	124	54
Zoonotic																
Psittacosis	0	0	2	0	0	0		0	0	0	0	2	0	2	1	1
Rabies (Animal)	1	0	3	3	0	0		0	0	0	0	7	9	19	23	23
Rocky Mtn. Sp. Fever	0	0	2	1	4	0		0	0	0	0	7	5	16	13	14
Tularemia	0	1	1	2	2	0		0	0	0	0	6	6	11	9	19

Low Frequency Diseases

Anthrax
Botulism
Brucellosis - 1
Chancroid
Cholera
Cryptosporidiosis - 17
Encephalitis (infectious)
Encephalitis (viral/arbo-viral)
Granuloma Inguinale
Kawasaki Disease - 2
Legionellosis - 5
Leptospirosis
Lymphogranuloma Venereum
Malaria - 4
Plague
Rabies (human)
Reye Syndrome
Rheumatic fever, acute
Toxic Shock Syndrome - 2
Trichinosis

Outbreaks

Foodborne
Waterborne - 1
Nosocomial
Pediculosis - 2
Scabies - 2
Other
Hand/Foot/Mouth - 2
ARI - 1
Chickenpox - 1
Rash - 1
Shigella - 1

*Reporting Period Beginning June 29, Ending September 27, 1997.
**Totals do not include KC, SLC, SLCo, or Springfield
***State and Federal Institutions

Due to data editing, totals may change.

TEAR OUT FOR FUTURE REFERENCE

Tuberculosis Case Report

(continued from page 2)
physicians caring for children to screen all high risk children, report positive skin tests to their county health department and initiate preventive therapy as indicated.

For more information about the prevention of tuberculosis in children, call the Missouri Department of Health's Bureau of Tuberculosis Control at (800) 611-2912.

REFERENCES

1. American Thoracic Society. Treatment of tuberculosis and tuberculosis infection in adults and children. Am J Respir Crit Care Med 1994;149: 1359-74.
2. International adoptions pose extra TB problems. TB Monitor 1997; August:91-93.

Tuberculosis Skin Testing

(continued from page 3)

immunodeficiency virus. J Infect Dis 1995;172:79–87.

6. Daley CL, Hahn JA, Hopewell PC, Moss AR, Schecter GF. Incidence of tuberculosis in injection drug users in San Francisco, 1990-1994 [abstract no. 11]. Lancet Conference on the Challenge of Tuberculosis, Washington D.C., September 1995.
7. Graham NMH, Galai N, Nelson KE, et al. Effect of isoniazid chemoprophylaxis on HIV-related mycobacterial disease. Arch Intern Med 1996;156: 889–94.
8. Markowitz N, Hansen NI, Hopewell PC, et al. Incidence of tuberculosis in the United States among HIV-infected persons. Ann Intern Med 1997;126: 123–32.

Submitted by James Gollop, M.D., M.P.H., Acting Chief, Tuberculosis Branch, Hawaii State Department of Health.

State Public Health Laboratory Report

Newborn Screening — Hypothyroidism, Phenylketonuria, Galactosemia and Hemoglobinopathies

James Baumgartner, B.S., M.B.A., Chief, Metabolic Disease Unit

	Sept 97	Oct 97	Total YTD
Specimens Tested	9,809	9,696	96,964
Initial (percent)	70.0%	70.0%	64,025
Repeat (percent)	30.0%	30.0%	32,939
Specimens: Unsatisfactory	105	103	1,790
HT Borderline	872	850	8,572
HT Presumptive	19	21	205
PKU Borderline	1	0	5
PKU Presumptive Positive	0	0	8
GAL Borderline	7	8	295
GAL Presumptive Positive	2	2	33
FAS (Sickle cell trait)	88	94	802
FAC (Hb C trait)	19	25	226
FAX (Hb variant)	13	13	142
FS (Sickle cell disease)	1	6	22
FSC (Sickle C disease)	1	0	11
FC (Hb C disease)	0	0	4

HT = Hypothyroidism, PKU = Phenylketonuria, GAL = Galactosemia, Hb = Hemoglobin, YTD = Year to Date

VIDEOCONFERENCE

Epidemiology and Prevention of Vaccine-Preventable Diseases

The Bureau of Immunization will sponsor the Centers for Disease Control and Prevention satellite broadcasts "Epidemiology and Prevention of Vaccine-Preventable Diseases" on four consecutive Thursdays this spring: April 9, 16, 23 and 30. Please mark the dates on your calendar.

Topics to be discussed include: Principles of Vaccination, General Recommendations of Immunization, the Childhood Immunization Initiative, as well as the individual vaccines. The broadcasts will feature question-and-answer sessions in which participants nationwide can address questions to the course instructors on toll-free telephone lines. Continuing education credits will be offered for a variety of professions.

For more information about the course, site locations and broadcast times, please contact the immunization representative located in each of the district health offices or the Bureau of Immunization at (573)751-6133.

1997 Index for *Missouri Epidemiologist*

ARTHROPODS
Borreliosis M/J97
Ehrlichiosis M/J97
Encephalitis surveillance J/F97
Mosquito-borne disease surveillance J/F97
Rocky Mountain spotted fever M/J97
Tick-borne disease summary-1996 M/J97
Tularemia M/J97

COMMUNICABLE DISEASE SUMMARIES
Annual summary 1996 M/J97
Outbreak summary 1996 M/J97
Quarterly Reports:
October–December 1996 M/A97
January–March 1997 M/J97
April–June 1997 J/A97

COMMUNICABLE DISEASE SURVEILLANCE
Computer Bulletin Board System J/A97
Health statistics for 1996 N/D97
Helicobacter pylori fact sheet S/O97
Hepatitis A in southwestern Missouri J/F97
Infectious disease mortality in Missouri—1980 to 1995 S/O97
New case definitions for notifiable diseases J/A97
Terms used in case classification J/A97

DIARRHEAL ILLNESS
Campylobacter M/J97
E. coli O157:H7 M/J97
Enteric diseases annual summary 1996 M/J97
Food recalls N/D97
Giardiasis M/J97
Salmonellosis M/J97
Shigellosis M/J97
Yersinia enterocolitica M/J97

ENVIRONMENTAL
Big River mine tailings lead exposure study J/A97
Bureau of Environmental Epidemiology 1996 Annual Report M/J97
Cancer investigation in Cadet, Missouri M/A97
Childhood lead poisoning prevention program M/J97
Cold-related illness prevention S/O97
Diseases and conditions passive surveillance system M/J97
Exposure investigation in Cadet, Missouri M/A97
Frostbite S/O97
Hazardous substance emergency events surveillance—1996 M/J97
Heat advisories M/A97
Heat-related illnesses and deaths M/A97
Heat-related illness prevention M/A97
Heat surveillance in 1997 M/A97
Heat surveillance summary—1996 M/A97
Hot weather health advisories M/A97
Hypothermia S/O97
Lead exposure study J/A97
Lead poisoning prevention M/J97
Medications which impair response to heat M/A97
Mine tailings lead exposure study J/A97
Public health assessment M/J97
Radiological health program M/J97
Risk assessment programs M/J97
Special studies on hazardous substances M/J97

FOODBORNE ILLNESS
Campylobacter M/J97
E. coli O157:H7 M/J97
Enteric diseases annual summary 1996 M/J97
Food recalls N/D97
Hepatitis A in southwestern Missouri J/F97
Salmonellosis M/J97
Yersinia enterocolitica M/J97

HAZARDOUS SUBSTANCES
Cancer investigation in Cadet, Missouri M/A97
Childhood lead poisoning prevention program M/J97
Exposure investigation in Cadet, Missouri M/A97
Hazardous substance emergency events surveillance—1996 M/J97
Lead poisoning prevention M/J97
Radiological health program M/J97
Risk assessment programs M/J97
Special studies M/J97

HEPATITIS
Annual summary 1996 M/J97
Hepatitis A in southwestern Missouri J/F97
Hepatitis B immunization schedule J/F97
Hepatitis B perinatal policy S/O97
Hepatitis C case definition J/A97
Hepatitis non-A, non-B case definition J/A97

HIV/AIDS
(see SEXUALLY TRANSMITTED DISEASES)

IMMUNIZATION/VACCINE-PREVENTABLE DISEASES
ACIP/AAP/AAFP immunization schedule—Jan–Dec 1997 J/F97
Annual summary 1996 M/J97
Childhood Immunization Schedule J/F97
DTaP—immunization schedule update J/F97
Diphtheria—immunization schedule update J/F97
Diphtheria antitoxin availability J/A97
H. influenzae type b disease M/J97
immunization schedule J/F97
Hepatitis B immunization schedule J/F97
Influenza
1996–97 summary J/A97
vaccine recommendations for 1997–98 J/A97
Innovative partnerships to improve immunization rates M/A97
Measles M/J97
Measles-Mumps-Rubella immunization schedule J/F97
Pertussis M/J97
Pertussis—immunization schedule update J/F97
Polio—immunization schedule update J/F97
Rubella M/J97
Rubeola M/J97
Springfield/Greene County action to improve immunization rates M/A97

Tetanus M/J97
Tetanus—immunization schedule update J/F97
Vaccine-preventable disease
1996 annual report M/J97
January–June 1997 update J/A97
Varicella immunization schedule J/F97
Yellow fever vaccination centers M/A97

MATERNAL, CHILD AND FAMILY HEALTH
Air bag injuries to children and small adults M/A97
ACIP/AAP/AAFP revised immunization schedule J/F97
Alternatives to abortion J/F97
Charge for metabolic and genetic disease screening J/A97
Childhood Immunization Schedule J/F97
Childhood lead poisoning prevention program M/J97
Congenital syphilis M/J97
Health statistics for 1996 N/D97
Hepatitis B perinatal policy S/O97
Healthy Child Care Missouri N/D97
Innovative partnerships to improve immunization rates M/A97
Osteoporosis Prevention and Education Program S/O97
Passenger safety M/A97
TEL-LINK J/F97
Vaccine-preventable disease
1996 annual report M/J97
January–June 1997 update J/A97
Well-Child Outreach Program J/F97

MINORITY HEALTH
HIV/AIDS M/J97
Tuberculosis M/J97

MISCELLANEOUS
Air bag injuries M/A97
Bureau of Communicable Disease Control announces two appointments N/D97
Bureau of HIV/AIDS Care and Prevention Services J/A97
Cancer investigation in Cadet, Missouri M/A97
Computer Bulletin Board System J/A97
Department of Health home page M/A97
Dr. Dempsey named state health director J/A97
Electronic health information resources N/D97
Health statistics for 1996 N/D97
Internet access to Department of Health M/A97
Osteoporosis Prevention and Education Program S/O97
Passenger safety M/A97
Public health information on world wide web S/O97

NOSOCOMIAL INFECTIONS
Outbreak summary 1996 M/J97

OCCUPATIONAL
Bureau of Environmental Epidemiology
1996 annual report M/J97
Cold-related illness prevention S/O97
Hazardous substance emergency events surveillance—1996 M/J97
Heat-related illness prevention M/A97
HIV postexposure prophylaxis registry N/D97
Hotline for exposure to HIV or other blood borne pathogens N/D97
Influenza vaccine recommendations for 1997–98 J/A97
Medications which impair response to heat M/A97
Missouri fatal accident circumstances and epidemiology (MOFACE) M/J97
Diseases and conditions passive surveillance system M/J97

RABIES
Animal surveillance 1996 M/J97
Pre-exposure vaccination J/A97

RESPIRATORY DISEASE
Influenza
1996–97 summary J/A97
vaccine recommendations for 1997–98 J/A97
Legionella outbreak M/J97
Legionnellosis case definition J/A97

SEXUALLY TRANSMITTED DISEASES
Annual summary 1996 M/J97
Chlamydia M/J97
Congenital syphilis M/J97
Early syphilis M/J97
Gonorrhea M/J97
HIV/AIDS care and prevention update J/A97
HIV disease:
Annual summary 1996 M/J97
Occupational exposure hotline N/D97
Postexposure prophylaxis registry N/D97
Treatment guidelines M/J97
St. Louis STD/HIV prevention training center M/A97
Youth at risk M/J97

STATE PUBLIC HEALTH LABORATORY
Annual report 1996 M/J97
Charge for metabolic and genetic disease screening J/A97
Newborn screening statistics J/F97
M/A97, M/J97, J/A97, N/D97

TUBERCULOSIS
Annual report 1996 M/J97
Criteria for reporting cases J/F97
Diagnostic services J/F97
Hospital discharge study J/F97
Reporting tuberculosis infection J/A97
Tuberculosis awareness fortnight N/D97
Tuberculosis infection in Missouri J/A97
Ultraviolet light therapy M/J97

WATERBORNE ILLNESS
Giardiasis M/J97

ZOONOTIC DISEASES
Borreliosis M/J97
Ehrlichiosis M/J97
Encephalitis surveillance 1996 J/F97
Mosquito-borne disease surveillance—1996 J/F97
Pre-exposure rabies vaccination J/A97
Rabies surveillance-1996 M/J97
Rocky Mountain spotted fever M/J97
Tick-borne disease summary-1996 M/J97
Tularemia M/J97

KEY

J/F97 = January/February 1997
M/A97 = March/April 1997
M/J97 = May/June 1997
J/A97 = July/August 1997
S/O97 = September/October 1997
N/D97 = November/December 1997

MOHSAIC

(continued from page 5)

that allows the sharing of immunization information without parental/guardian consent. These include amendments to sections 167.183, 210.003, and 192.068, RSMo. DOH staff have also addressed the need to limit access to this information and created a means to track access to and changes in data.

DOH is working with managed care organizations to introduce the capabilities of MOHSAIC and to identify ways they or private providers can enter and retrieve data. Ways to participate in MOHSAIC include:

- Collaborate with the local public health agency to manually enter records.
- Dial into MOHSAIC to view records or directly enter immunization records for clients not already in the central registry.
- Establish a direct line to MOHSAIC for larger pediatric providers.

DOH staff are also researching the feasibility of abstracting immunization information from electronic billing or patient management systems to merge with the central registry data.

For more information on MOHSAIC or to learn how to participate, contact the DOH Bureau of Immunization at (573) 751-6133 or the Center for Health Information Management and Epidemiology at (573) 751-6272.

REFERENCE:

1. Institute of Medicine. The future of public health. Washington DC: National Academy Press, 1989.

UPCOMING CONFERENCE:

Osteoporosis Clinical Update, 1998

May 2, 1998
Ritz Carlton
Kansas City, MO

This conference is for physicians and allied health professionals. Five CME credit hours are available.

For more information and/or registration form, please contact:

Virginia Beatty
Missouri Department of Health
(573) 876-3209
or
Barbara Sterkel, M.D.
Missouri Osteoporosis Foundation
(314) 454-5951

LATE BREAKERS

☞ Revised Vaccine Information Materials for diphtheria/tetanus/pertussis (DTP, DTaP, Td) are now available from the Bureau of Immunization. The Bureau of Immunization is mailing camera-ready copies of the Missouri version of these revised vaccine information materials to physicians and local public health agencies. If you need a copy, please contact the Bureau of Immunization at (573) 751-6133.

Under the National Childhood Vaccine Injury Act, the Centers for Disease Control and Prevention (CDC) must develop informational materials that health care providers are required to distribute to patients or parents of patients before each dose of specific vaccine is administered. CDC announced the availability of the revised vaccine information materials in the *Federal Register* on January 9, 1998.

Other vaccines covered under the Act are measles, mumps, rubella and polio. All health care providers are required to record in the patient's permanent medical record the date and version of materials provided as well as the provider administering the vaccine, the date of administration, manufacturer and lot number of vaccine used.

☞ **Vaccines for Children (VFC) Update for 1998:**

Beginning March 1, 1998, any adolescent who is eligible for VFC may receive the hepatitis B vaccine. Providers should make every effort to vaccinate adolescents before they reach age 19.

The following are the minimum intervals between hepatitis B immunizations:

Dose 1 and 2: 1 month (4 weeks–28 days)
Dose 1 and 3: 4 months (16 weeks–112 days)
Dose 2 and 3: 2 months (8 weeks–56 days)

If you have questions, please contact the immunization representative located in each of the district health offices or the Bureau of Immunization at (800) 699-2313.

☞ The Bureau of Immunization has a new toll-free telephone number. The number is (800) 699-2313.

Missouri
EPIDEMIOLOGIST

Published by the
Missouri Department of Health
P.O. Box 570
Jefferson City, MO 65102-0570
www.health.state.mo.us

The *Missouri Epidemiologist* is a regularly scheduled bimonthly newsletter published jointly by the Office of Epidemiology, Center for Health Information Management and Epidemiology (CHIME) and the Division of Environmental Health and Communicable Disease Prevention (EHCDP). CHIME's responsibilities include managing health statistical systems, epidemiological functions and information systems of the department. EHCDP's responsibilities include the prevention and control of communicable diseases and environmentally induced illnesses, including the requisite epidemiological investigations.

The Managing Editor is H. Denny Donnell, Jr, MD, MPH, State Epidemiologist. Production Manager is Diane C. Rackers. Questions or comments should be directed to (573) 751-6128 or toll free (800) 392-0272.

Alternate forms of this publication for persons with disabilities may be obtained by contacting the Missouri Department of Health, Office of Epidemiology, P.O. Box 570, Jefferson City, MO 65102-0570, Ph: (573) 751-6128. TDD users can access the preceding phone number by calling (800) 735-2966.

Public Health Week
April 6–12, 1998

Public Health Week will be recognized in Missouri and around the nation April 6–12, 1998. The theme of this year's celebration is *Healthy People in Healthy Communities*. The Department of Health, the Missouri Public Health Association and the Missouri Association of Local Public Health Administrators are collaborating to encourage celebration of Public Health Week around the state.

Public health professionals and agencies at all levels are encouraged to showcase their many accomplishments in protecting individual and community health.

While most people don't think about it, local public health services have an impact on almost everything we do in a day. From giving immunizations to children, to inspecting restaurants for sanitation, providing birth certificates and testing the quality of well water, public health touches all aspects of our health and safety.

For more information, please contact Nanci Gonder, Public Information Officer, Missouri Department of Health, at (573) 751-6062; Lorna Wilson, Executive Director, Missouri Association of Local Public Health Administrators, at (573) 659-8828; or Nancy Jones, President, Missouri Public Health Association, at (314) 658-1123.